



Plant characteristics

By Flickr user Schristia

Plant responses

- Plants respond to their environment (slowly, but they do respond)
- Response to light: Phototropism

When a plant is turned around, it will bend towards the light. The cells on the non-light side grow longer while the other side grows shorter, bending the plant

Plant responses

- Response to touch: Thigmotropism
Some plants move in response to touch (Venus Fly Trap) or grow wrapping themselves along objects (vines)



Plant responses



By Flickr user Ivanlee8

- Response to gravity:
Geotropism
If a germinating plant is turned upside down (roots upward and stem downward), they will grow the right way by bending and growing in the right direction

Plant reproduction

- Plants reproduce sexually (pollen from flower stamen sticks to the central stigma. Pollen moves down to the ovary to fertilize the egg.

The result? A seed.

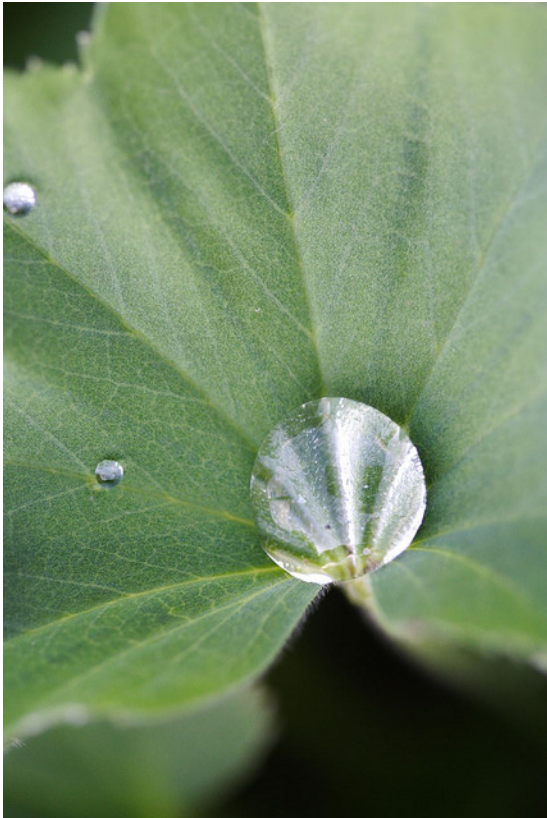
- Self-pollination: Pollen is transferred to the stigma in the same flower.
- Cross-pollination: Pollen is transferred to the stigma in a different flower.
- Seeds have specialized structures to be carried by wind, water, or animals to have a chance to grow in a new area.

Homeostasis

- Maintaining a stable internal environment by:
- Stomata: opening and closing the pores in the leaf to minimize water vapor loss (also bring in max carbon dioxide for photosynthesis)
- Plants are dormant when the weather is cold (evergreens aren't dormant as they have small, thin leaves that do not lose moisture or heat as fast as wide, broad leaves)
- When living in a poor environment, they develop strategies to add nutrients to their diet (Venus fly trap in a poor nitrogen environment)

Plant metabolism

- Photosynthesis (using sun's energy to make food in green plants.) $6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$
- Respiration (opposite of photosynthesis – using food to create energy) $\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O}$



Movement of water upwards in a plant:

- Capillary action – water is attracted to the sides of the xylem. Loss of water from the leaves drives water up the vascular bundle
- Cohesion – water is attracted to other water molecules
- Adhesion – Attraction of water to other materials
- These forces work together. As one water molecule moves up the xylem, it drags the next molecule along with it and so forth.

Auxins

- Plant hormones that control growth
- Responsible for fruit ripening and even spoiling
- Gibberrellic acid is responsible for growth of the plant from the embryo (seed)
- Auxins promote the production of ethylene which cause the leaves to fall off deciduous trees and cause fruit to go bad (which causes all the others to go bad.)